

REMARKS

Claims 131-151 remain in the case. By the above amendment an inadvertent omission in Claim 133 has been corrected. In particular, the 100,000 value given in Claim 133 clearly relates to “ppm” as shown for example at line 6 of Claim 142 and the specification at Page 4, line 19.

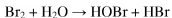
Claims 131-151 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodenough, et al. (US 3,558,503) in view of Dallmier, et al. (US 5,683,654) and the McKinnie Declaration. This rejection is deemed inapplicable and untenable. Reconsideration is thus requested in light of the following comments:

The rejection itself in effect acknowledges that Goodenough standing alone is an inadequate reference. Accordingly, Dallmier and the McKinnie Declaration are cited in an attempt to provide support for the rejection. However, Dallmier fails entirely as support for the rejection because Dallmier actually refutes the technology presented by Goodenough and leads to use of processing that is foreign to that of Goodenough. This is clearly shown, for example, by the following refutations of the Goodenough approach as given by Dallmier:

“However, the bromine solutions prepared according to the Goodenough et al. reference teachings are not stable enough for practical use in commercial cooling water, oil field and other industrial applications.” (Column 2, lines 15-18)

“Because elemental bromine is used in the process disclosed in the Goodenough et al. reference, this process is difficult to complete as well as potentially hazardous since elemental bromine is a fuming, corrosive, toxic liquid.” (Column 2, lines 28-32)

“Additionally, bromine is wasted in the process disclosed in the Goodenough et al. reference. The reaction according to this process is as follows:



Because the produced HBr does not function as a biocide, one half of the bromine adds nothing to the strength of the biocidal species, HOBr. This invention disclosure improves on the Goodenough et al. reference by means of a safer, easier, and more economical process.” (Column 2, lines 37-47)

Clearly, therefore, Dallmier teaches away from any process in which elemental bromine is charged into a reaction solution. Instead, Dallmier utilizes a bromide ion source (e.g., NaBr, KBr, LiBr, HBr) and an oxidant as feeds to the reaction mixture. Moreover, Dallmier resorts to a process in which the bromine is charged into a reaction solution prior to addition of any stabilizer component. Indeed, Dallmier specifically requires that the added bromide ion source be allowed to react in the reaction mixture in order to form an unstabilized alkali or alkaline earth metal hypobromite. See for example: Col. 3, lines 62-65; Col. 4, lines 17-20; Col. 4, lines 41-47; Col. 4, lines 61-64; Col. 6, lines 6-9; Col. 12, lines 26-29; and Col. 13, lines 15-18.

Still further, Dallmier requires addition of the stabilizer after the unstabilized alkali or alkaline earth metal hypobromite has been formed. See for example: Col. 3, line 66; Col. 4., line 1; Col. 4, lines 21-23; Col. 4, lines 65-67; Col. 6, lines 10-12; Col. 12, lines 30-32; and Col. 13, lines 19-21.

Moreover, Dallmier repeatedly emphasizes that it is critical to utilize the particular sequence of operations described by Dallmier. For example in Column 6, lines 32-35, Dallmier states:

“Based on the surprising increased stability of the stabilized sodium hypobromite of this invention, it is apparent that the order of addition in the process of manufactured is critical.”

Indeed, after demonstrating in Example 1, the particular order of addition of the Dallmier invention, Dallmier proceeds by stating in Example 1:

“The order of addition is critical in this process which differs from the Goodenough et al. reference. For instance, if the stabilizer was added to NaOCl prior to NaBr introduction, the bromide would not be oxidized to hypobromite. Also, bromine solutions prepared in the manner referenced above gave more stable oxidizing species than the prior art. Bromine solutions stabilized as explained in the Goodenough et al. reference exhibited a decrease in halogen activity from an initial concentration of 1% to 0.77% after fourteen days representing an active ingredient loss of 23%. The stabilization procedure described here improved on the prior art as the decline of active ingredient was only 1% after 84 days (see Table I above). An unstabilized NaOBr solution prepared in an similar process by replacing sulfamic acid with distilled water lost 94% available halogen during the same period.” [Emphasis added]

Therefore, not only does Dallmier resort to processing that is foreign to Applicants’ claimed subject matter but which is also foreign to the processing described by Goodenough. Accordingly it is submitted that the combination of Goodenough and Dallmier is an incompatible combination of references and that one of ordinary skill in the art would not consider these documents in combination with each other. This is made manifestly clear not only by the fact that Goodenough and Dallmier describe processes which differ from each other for preparing stabilized bromine compositions, but by the fact that Dallmier teaches in no uncertain terms that the Goodenough process produces bromine solutions which are not stable enough to be practical for use in commercial cooling water, oil field, and other industrial applications.

Thus Dallmier does not improve the Goodenough process. Instead, Dallmier provides, in its own words, “a safer, easier and more economical process.” See Col. 2, lines 46-47. Therefore, it is respectfully submitted that the combination of Goodenough and Dallmier is an improper combination of references which realistically could only arise by exercise of hindsight.

The skilled artisan is taught by Dallmier to resort to his specified sequence of steps which involves (a) mixing a water soluble bromine source with an oxidizing agent such as an alkali or alkaline earth metal hypochlorite with a water, (b) allowing the bromide ion source and the alkali or alkaline earth metal hypochlorite to react to form an unstabilized alkali or alkaline earth metal hypobromite, (c) adding to the unstabilized solution of such hypobromite an aqueous solution of alkali metal sulfamate at a temperature of at least 50°C, and (d) recovering a stabilized aqueous alkali or alkaline earth metal hypobromite solution. Thus, it is respectfully submitted that any attempt to ignore these teachings of Dallmier by picking and choosing only so much of the reference as is desired to support a rejection would be impermissible. As stated, in *In re Fritch*, 972 F. 2d 1260, 23 USPQ 1783-84 (Fed. Cir. 1992):

“It is impermissible to use the claimed invention as an instruction manual or ‘template’ to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that ‘[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.’ ”

On the basis of the above comments, it is believed that on reconsideration the rejection should be withdrawn and the claims be found allowable.

In the Office Action (page 5), it is stated that no data has been provided by the Applicants with respect to the significance of the instant ordering of steps in the formation of the liquid biocide. It is submitted however, that there is no need to present any such data because (1) a *prima facie* case of obviousness has not been established for reasons including those given above, and (2) it is self-evident from the present claims and from the present disclosure that the invention provides a new highly efficient, economical and safe process capable of producing concentrated aqueous biocidal solutions on a single concurrent feed basis.

Dr. Nalepa, one of the present applicants, points out that the processes of present Claims 135-151 are capable of producing highly stable concentrated aqueous biocidal

solutions because the processes are amenable to operation as continuous processes. This in turn translates into more efficient, more economical and safer operation in smaller, less expensive reaction equipment. Such operation is not suggested nor is it made possible by either Goodenough or Dallmier because of the deficiencies inherent in the Goodenough processes as made clear and found experimentally by Dallmier, and the multiple process steps required in the Dallmier process.

In the case of Claims 131-134, there is involved a new concept of bringing (i) elemental bromine and (ii) aqueous alkali metal hydroxide solution into contact with (iii) an aqueous solution formed from water, sulfamic acid and alkali metal base wherein the solution of (iii) is present in the reactor and the solution of (ii) maintains the pH of the biocidal solution being formed in the reactor in the range from about 12 to about 14. Again, there is no suggestion in either Goodenough or Dallmier of the novel concept involved in this process. Thus the subject matter of Claims 131-134 is by no means "obvious".

The Action, bottom of Page 3, contends that after reading Goodenough in light of Dallmier, an artisan in the field would have been motivated to carry out a process of producing a biocide in the single step of co-feeding into a reactor comprising sulfamic acid, water, and magnesium hydroxide (i) bromine and (ii) an alkali metal solution at about 12 to about 14. However in reality, not only the teachings but also the experimental results reported by Dallmier would lead the artisan to disregard Goodenough. Why? Because the Goodenough process is an undesirable way to proceed. Indeed, Dallmier has repeatedly pointed out severe shortcomings of the Goodenough process, including the following:

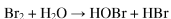
► . . . [T]he bromine solutions prepared according to the Goodenough et al. reference teachings are not stable enough for practical use in commercial cooling water, oil field and other industrial applications. (Column 2, lines 15-18)

► . . . [T]he manner in which the bromine solutions are prepared provide relatively low stabilities and low available halogen concentrations compared with the discoveries claimed within this invention disclosure. (Column 2, lines 22-25)

► Because elemental bromine is used in the process disclosed in the Goodenough et al. reference, this process is difficult to complete as well as potentially hazardous since elemental bromine is a fuming, corrosive, toxic liquid. (Column 2, lines 27-31)

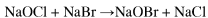
► The Goodenough et al. reference mentions that the available bromine concentration immediately following preparation was about 1% by weight. The low bromine concentration achieved by this method was due in part to bromine being soluble at just 4% in cold water. (Column 2, lines 32-36)

► . . . [B]romine is wasted in the process disclosed in the Goodenough et al. reference. The reaction according to this process is as follows:



Because the produced HBr does not function as a biocide, one half of the bromine adds nothing to the strength of the biocidal species, HOBr. (Column 2, lines 37-45)

► The method described in the Goodenough et al. reference could not achieve these increased bromine levels as the order of reagent addition described in the reference was deemed not critical to the operability of the method. Since NaOBr is synthesized by the following reaction:



addition of the stabilizer prior to bromide oxidation would not permit the formation of NaOBr. (Column 2, lines 56-63)

These gross deficiencies noted by Dallmier concerning the Goodenough processes, lead the artisan away from Goodenough and to proceed with processing of the type described by Dallmier, *i.e.*, producing bromine *in situ* by oxidizing a bromide source and conducting the reaction using the four steps of a. through d., as repeatedly set forth in Dallmier.

The Office Action next contends that one would have been motivated to conduct the Goodenough process in a single step to avoid carcinogenic formation. With all due respect, this contention cannot be accepted. It is Dallmier, not Goodenough, that discloses how to avoid bromate formation. See in this connection the following excerpt from the Dallmier patent at Column 3, lines 28-32:

“One use of the present invention, which was previously unknown and is surprising, is to greatly minimize bromate formation by stabilizing hypobromite when conditions are favorable for bromate production.”

As a matter of fact, in the second full paragraph on Page 3, the Office Action itself emphasizes that it is Dallmier that suggests reduction in bromate formation:

“Dallmier discloses a process that ‘improves on the Goodenough et al. reference by means of a safer, easier, and more economical process.’ (column 2 lines 45-47). As confirmed by Moore’s own expert, Dallmier suggests that a sulfamic acid stabilized hypobromite such as N-bromosulfamate can be stored in a high pH solution ranging from about 8 to about 14 and more preferably from about 11 to about 14 with minimal suspected carcinogen bromate formation. (column 3 lines 28-32; column 4 lines 47-49; column 9 line 65 – column 10 line 60). As taught by Dallmier, the formation of bromate occurs from a reaction involving hypobromite as a reactant and stabilized hypobromite (column 3 lines 24-26; column 10 lines 1-8).”

Since Goodenough says nothing about bromate formation, the artisan is clearly led to employ process technology of the type described by Dallmier rather than that of Goodenough. This in turn means that one would be led to use the reagents and the critical reaction sequence described by Dallmier.

The Office Action contends with respect to Claims 131-134 that the number of feeding lines is a experimental design choice and that one skilled in the art would know that several feeding line scenarios could be employed to produce the instant liquid biocide

composition. We respectfully ask: Out of a huge number of experimental design choices, what would lead one to select the particular line scenario set forth in the present claims, especially since the feeding line scenario used by Dallmier is repeatedly deemed and shown by Dallmier to be critical? How can this express teaching by the Examiner's own reference be totally ignored? Moreover, claims 131-134 involve much more than a mere line choice – what is fed, to what it is fed, in what manner it is fed, and why it is so fed are factors involved in the present claims and involve a new concept which is not suggested by either Goodenough or Dallmier. We respectfully submit that use of a meaningless phrase such as “experimental design choice” amounts to a tacit admission that the references really do not suggest the claimed invention.

The Office Action then contends, with respect to Claims 135-151 that it would have been obvious to include steps of mechanical stirring, static mixing, removing product intermittently and using multiple reaction vessels at the time of the prior art invention. First of all, if it was known at the time of the prior invention, why did not the prior inventors (Goodenough or Dallmier) say something about them? Also, since the Action itself admits that neither Goodenough nor Dallmier teaches these steps, how could the artisan divine how to use such steps in order to benefit from their use? Unsupported speculative opinions in an Office Action do not constitute evidentiary facts sufficient to negate patentable invention.

It is also contended in the Action, middle of page 6, that one would have been motivated to include the foregoing steps in a pilot or commercial process in order to obtain high production rates. However, since the Action admits that these steps are not even taught in the applied prior art, no foundation exists for this contention. It is thus unsupported and unworkable.

As regards the above-referred to contentions in the Action, we wish to point out that an analogous situation was presented to the court in *In re Kuehl*, 475 F.2d 658, 177 USPQ 250 (C.C.P.A. 1973), in which “the board’s approach necessarily [treated] appellant’s own disclosure as ‘prior art’ under 35 U.S.C. Section 103, which it is not.” On appeal, the CCPA agreed with the applicant and rejected the Examiner’s rejection. Specifically, the CCPA stated that the:

“...examiner’s language does appear to treat incorrectly the ZK-22 zeolite as part of the prior art. The correct application of the test of Section 103 requires that the claims on appeal not be judged against any prior art other than Frillette” [the applied reference].

In other words, Kuehl teaches that an Examiner may not generally use new information regarding an invention disclosed in an application as prior art to support an obviousness rejection.

In view of the comments presented above, it is believed that the rejection of the present claims has been shown to be untenable and insupportable. Accordingly, it is respectfully requested that the rejection under Section 103 be reconsidered and withdrawn so that the claims may be allowed. Such action is earnestly solicited.

If, however, any matters remain requiring further consideration, it is respectfully requested that the Examiner telephone the undersigned so that such matters may be discussed and, if possible, be promptly resolved.

Please continue to address all correspondence in this Application to Albemarle Corporation, at their address of record.

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